



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

#8 Response
M. Baunser
12/12/02

Re Application of

Toshiya UEMURA et al.

Serial No.: 09/988,060

Group Art Unit: 2814

Filed: November 16, 2001

Examiner: Douglas A. Wille

For: A SEMICONDUCTOR LIGHT-EMITTING ELEMENT

Honorable Commissioner of Patents
Washington, D.C. 20231

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TECHNOLOGY CENTER 2800

REQUEST FOR RECONSIDERATION UNDER 37 C.F.R. §1.111

Sir:

In response to the Office Action dated July 17, 2002, reconsideration of the above-identified application is respectfully requested in view of the following remarks. Claims 1-12 remain pending in this application.

REMARKS

Attached hereto is a Petition and Fee for a one-month extension of time.

Claims 1-12 stand rejected under 35 U.S.C. §103(a) as unpatentable over U.S. Patent No. 5,877,558 to Nakamura et al. (hereinafter, Nakamura) in view of U.S. Patent No. 4,152,624 to Knaebel. With respect to claims 2-12, the Examiner asserts that the limitation of heat-treating the device in an atmosphere containing humidity is a processing limitation that does not carry weight in a claim to a structure.

Applicant respectfully traverses this rejection.

I. THE CLAIMED INVENTION

The claimed invention is directed to a semiconductor light-emitting element that includes a chip having at least an electrode and a protective film layer, and an insulating resin for sealing the chip. The insulating resin is hardened at high temperature and heat-treated in an atmosphere having humidity.

II. THE PRIOR ART REJECTION

A. The Nakamura Reference

Fig. 7 of Nakamura discloses a protective film 412 that covers the entire exposed surface of the p-electrode 15, the exposed edge surface of the p-type semiconductor layer 13, and the exposed surface of the n-type semiconductor layer 12 (col. 10, lines 41-45).

B. The Knaebel Reference

Knaebel discloses a molded LED indicator, where following encapsulation, the relationship of elements is maintained for a cure period, while the mold is raised to a cure temperature of about 120°--140° C. and the encapsulant permitted to cure for at least about one hour (col. 10, lines 48-52).

The prior art discloses that after curing at 120-140° C, heat treatment is carried out at 120-140° C for several hours as a post-cure. As a result, the device can be cured perfectly and its stress relaxed. That is, a curing treatment is preformed which is disclosed in paragraph [0069] in the original specification of the present invention, and is only a common process for curing resin. (in paragraph [0069] in the present specification, curing is carried out at the temperature of 120° C for 1 hour, and post cure is carried out at 150° C for 4 hours.)

The present invention, on the contrary, teaches a condition for solving problems which especially occur when a thin film electrode is used under a remarkably severe condition, which cannot be seen in such a common curing treatment process as disclosed in the prior art. The condition disclosed in the present invention is shown in paragraphs in the specification starting from [0070]. As disclosed in the paragraphs starting from [0070], the condition the present invention teaches is a low-temperature treatment which cannot generate a reaction of curing resin.

As there is a limitation of "having humidity," the uppermost limitation of the temperature defined by the present claims is less than 100° C. (Please note that there is no humidity at a temperature of 100° C or more.) Accordingly, the present claims do not include a common curing temperature of 120 to 150° C disclosed in the prior art.

As explained above, after carrying out a general curing treatment under the condition

shown in the prior art, the present invention further carries out an additional process, or a heat treatment for curing resin., in the atmosphere of low temperature with humidity. As a result, the present invention remarkably improves reliability of an LED using a thin-film electrode.

Thus, turning to the language of the claims, there is no teaching or suggestion of "a semiconductor light-dash emitting element comprising: a chip having at least an electrode and a protective film layer: an insulating resin for sealing said chip; wherein said insulating resin is hardened at high temperature a heat-treated and an atmosphere having humidity.

For at least the reasons outlined above, Applicants respectfully submit that Nakamura and Knaebel either individually or in combination do not show all the features of claim 1. Accordingly, Nakamura and Knaebel either individually or in combination fail to render obvious the subject matter of claim 1 and claims 2-12, which depend from claim 1, under 35 U.S.C. §103(a). Withdrawal of the rejection of claims 1-12 under 35 U.S.C. §103(a) as unpatentable over Nakamura in view of Knaebel is respectfully solicited.

III. CONCLUSION

In view of the foregoing, Applicant submits that claims 1-12, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

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The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

Date: 11/18/02

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